

The few silver coins of the series weigh about 44 grains, or 2.9 grammes each. The copper coins vary in weight from 43 to 163 grains, or 2.8 to 17.0 grammes.

The Arab systems of money and of weight are treated at great length in Queipo's "Systèmes Métriques et Monétaires des Anciens Peuples." The earlier gold unit was the *dinar*, and the later gold unit the *nichtal*. The *dinar* was the monetary unit, from the Roman *denarius*. The *nichtal*, which signifies weight, was the unit of monetary weight. Queipo gives a list of 263 gold dinars of the ancient Eastern caliphs which are now in various numismatic cabinets, with their weights. No coins were struck by Mahomet and his successors, who used the existing coinage of the countries, until the 78th year of the Hegira, when both gold and silver coins were struck by Abdelmelik, Caliph of Bagdad. The mean or normal weight of the gold *dinar* was 66 grains, or 4.25 grammes. This was the weight of the Attic drachma, from which it was evidently derived. There were also gold coins of $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{5}$ *dinar*.

The relation of the weight of the Arab silver *dirhem* to the gold *dinar* was as 7 to 10, or nearly as 2 to 3. Queipo gives a list of 592 Arab silver *dirhem* coins of Arabian caliphs from A.D. 699 to 1195, with the weight of each coin. This varied from about 2.5 grammes in the earlier part of this period up to a maximum weight of 3.1 grammes in later times, the mean weight of the *dirhem* being 2.84 grammes, or 44 grains. He mentions also silver coins of $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ *dirhem*. The half *dirhem* was thus nearly equivalent to our Saxon penny, the $\frac{1}{20}$ th of a pound of silver, and weighing 22½ troy grains.

Queipo makes but little mention of the Arab ancient copper moneys, except to throw a doubt on the existence of the *fels* as a copper coin, and to assume that it was only money of account, and also that the number of *fels* in a *dirhem* expressed merely the number of units corresponding with the value of copper in relation to silver. He shows that in the first centuries of the Hegira, the value of silver to gold was as 1 to 13, and of copper to silver as 1 to 120. If, therefore, a gold *dinar* weighed 4.25 grammes, its equivalent in copper would weigh 6,630 grammes; and as the number of *fels* in a *dinar* could not have exceeded 98, that this would give the improbable weight of 67.65 grammes to each copper *fels*. This was the weight of the Attic drachma, from which it was evidently derived. There were also gold coins of $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{5}$ *dinar*.

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shows that in the first centuries of the Hegira the value of silver to gold was as 1 to 13, and of copper to silver as 1 to 120. If a gold *dinar* weighed 4.25 grammes, its equivalent in copper would be 6,630 grammes, and as the number of *fels* in a *dinar* could not be more than 98, this would give the improbable weight of 67.65 grammes to each copper *fels*.

VAN BENEDEN'S "ANIMAL PARASITES"

Animal Parasites and Messmates. By P. J. Van Beneden, Professor at the University of Louvain, &c. (London: Henry S. King and Co., 1876.)

THIS work forms the twentieth volume of the International Scientific Series. We believe there was some doubt on the part of the publishers as to the propriety of bringing out a popular treatise on so uninviting a subject. To have omitted all account of this important series of creatures considered in relation to the welfare of man would, however, have been a serious blunder. It is high time that popular prejudices should be ignored, especially when the welfare of the people themselves is involved in the question at issue. Fully alive to the prejudices referred to, a writer in *Notes and Queries* (who was probably anxious to make the subject palatable) says of this little book: "There is as much amusement to be derived from Prof. Van Beneden's pages as there is instruction." We cannot take this optimist view of the matter; on the contrary, we fail to find anything amusing in the book, although, as might be expected from the author's known position as a man of science, there is much to be learnt from an attentive study of the text. Prof. Van Beneden's strength lies in a clear exposition of the phenomena of commensalism. We owe to his remarkable zoological acumen the correct interpretation of those singular phases of parasitic life which he has so happily classed under the rôle of Messmates and Mutualists, respectively. On this head he has strung together such a multitude of facts that his work cannot fail to be useful to working naturalists. Whether the general reader will find anything "amusing" in these pages is very doubtful. He may, indeed, if his mind be still dominated by the teachings of a certain school, find comfort in the assurance which M. Van Beneden affords that the welfare of all the most repulsive forms of insect life is most carefully looked after. What a comfort it must be for the poor Cayenne convict when tortured by insect parasites to know that the ever-helping "Hand" superintends the "preservation" of the larvæ of *Lucilia hominivora* with the same care that it does "the young brood of the most brilliant bird." Surely the Mexican soldier who "had his glottis destroyed, and the sides and the roof of his mouth rendered ragged and torn, as if a cutting punch had been driven into those organs," could hardly be brought to realise the need-be for such a process of development on the score of benevolence towards this frightful parasite! The case of *Lucilia* is by no means exceptional, since there are scores of parasites, both external and internal, that are capable of inflicting the most terrible sufferings alike upon man and beast. Push our author's Bridgewater-treatise-like views to their logical outcome, and it necessarily follows that every pang endured by countless

suffering hosts was expressly designed in order that man might appreciate the benevolence of the "Creator." Such a conception is too horrible to be entertained by reasonable creatures; nevertheless, it is in perfect harmony with certain other grossly anthropomorphic conceptions of Deity that are too commonly taught amongst us.

The general reader will not be able to follow M. Van Beneden very closely, unless he possesses a considerable amount of zoological knowledge; and he will find the book overlaid with scientific terms. The naturalist, on the other hand, will be disappointed by the paucity of literary references. Whilst our author shows himself to possess a profound knowledge of the facts of commensalism, his volume is very deficient in the treatment of the subject of parasitism, properly so called, more especially when he deals with those forms that are known as Entozoa. He has omitted all mention of some of the most important helminthological contributions and discoveries of recent times. Thus, there is no allusion to Lewis's "find" respecting nematoid hæmatozoa, and almost nothing is said of the ravages produced amongst domesticated animals by a variety of well-known internal parasites. In some places our author misleads, as in the case of the history of the discovery of *Trichina*, where Sir J. Paget's name is altogether omitted; and also, in the case of *Bothriocephalus*, where Knoch's views on the possibility of infection without the necessity of an intermediary bearer appear to be countenanced.

Some of the illustrations are very poor, and the misspelling of authors' names and of technical words is exceedingly frequent. The author appears to be but little informed respecting the writings of German and English helminthologists. Notwithstanding these defects, M. Van Beneden's book ought to be purchased by every intelligent naturalist.

T. S. COBBOLD

OUR BOOK SHELF

The Scholar's Algebra: an Introductory Work on Algebra. By Lewis Hensley, M.A. (Oxford: Clarendon Press; London: Macmillan and Co., 1875.)

THIS is one of the Clarendon Press Series, hence we are saved all necessity of remarking upon the get-up of the volume. We had hardly expected that Mr. Hensley could have imparted any freshness to his treatment of so hackneyed a subject as an Elementary Algebra, but he has done so, and we have read his work with much interest. It does not follow the usual course observed in similar treatises either in its contents or in their arrangement. Our author himself expressly states that the work professes to be an introductory one on algebra. He takes up the scholar who has been well-grounded in arithmetic and endeavours to explain from the outset what algebra is, what its aims, and what the chief forms of its utility. In this attempt he has succeeded, and the work is likely to be of use to students who are reviving an acquaintance with the subject acquired at school, but especially is it suited to self-taught students. For these latter it is, we think, one of the best text-books hitherto brought out. The first seventy pages are devoted to the symbols, signs, and elementary rules; in this section we have a good chapter on Ratio and Proportion, including a glance at incommensurables. Though treated at this length, the scholar is hardly likely to grow weary in his work, and he is laying at the same time a safe and solid foundation for future use.

In Part II. we have Algebraical formulæ (Interest, the Progressions), then Equations (Simple and Quadratic), next Investigation of Methods (Involution and Evolution), closing with a supplement on unknown quantities, Inequalities, Indices (fractional and negative). The third Part opens up to the student under Algebraical formulæ, Permutations, Binomial Theorem, Notation, Harmonic Progression, and simple series, then Equations (more advanced than the previous ones), Surds, Indeterminate Equations and applications of Horner's method. We have then a chapter on Continued Fractions¹ and another on Logarithms. Some idea of the character of the work will be got from the order and nature of the subjects above mentioned, and it will be seen that a prominent feature is the importance attached to methods of calculation. Indeed, Mr. Hensley says he has remarked in the Universities a growing disposition to compel the student of the higher mathematics to interpret his results numerically. To this he gives the weight of his experience: "There can be no better guarantee that he understands what he is about." We may mention that the extension of meaning of the negative sign and of symbols generally, though but slightly glanced at, is yet introduced to the reader's notice. No place is given to properties of numbers, multinomial theorems, convergency of series, higher series, or probabilities. The curriculum is much that laid down by the London University for candidates for the first B.A. (Pass), and we can recommend the book before us as one well suited for such candidates, as containing all they require, and but little beyond what they need take up for the examination.

We shall touch lightly here upon the errata. They are not very serious, and though somewhat numerous, do not by any means come up to the usual standard in this respect of first editions. On p. 98, line 5, for youngest read eldest; p. 127, last three lines, statements should be *vice versa*; p. 205, line 5 up, read 7×52 .

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

Fritz Müller on Brazil Kitchen Middens, Habits of Ants, &c.

[MR. CHARLES DARWIN has kindly sent us for publication the following letter, addressed to him by Herr Fritz Müller, the well-known naturalist, brother of our contributor, Dr. Hermann Müller, and who has for so long been devoting himself to natural history researches in Brazil.]

My dear Sir,—In Desterro I met with two young men (M. Charles Wiener, of Paris, and M. Carl Schreiner, from the National Museum of Rio) who, by order of the Brazilian Government, were examining the "Sambaquis" of our province. I accompanied them in some of their excursions. These "Sambaquis," or "Casqueiros," are hillocks of shells accumulated by the former inhabitants of our coast; they exist in great number, and some of them are now to be found at a distance of several miles from the sea-shore, though originally they were, of course, built near the spot where the shells lived. Some are of considerable size; we were told that a Sambaqui on a little island near San Francisco had a height of about 100 metres; but the largest I have seen myself did not exceed 10 or 12 metres. As to the shells of which they are composed, the Sambaquis may be divided into three classes, viz.: (1) Sambaquis, consisting of many different species of bivalve and univalve shells (Venus, Cardium,

¹ We observe that our author says that these were first used by Lord Brouncker; it has been shown that Cataldi has a prior claim to this distinction.